AMENDMENTS TO THE CLAIMS

1. (Canceled)

2. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the surface carrying the coat is made of organic material.

3. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the surface of the planar substrate is made of plastics.

4. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the non-ionic hydrophilic polymer is attached covalently directly to the surface or to a polymer skeleton that is attached to the surface.

5. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the microfluidic device comprises more than five covered microchannel structures.

6. (canceled)

7. (Currently Amended) A microfluidic device being in a dry state that is capable of being rehydrated, said device comprises a set of one or more covered microchannel structures manufactured in the surface of a planar substrate, wherein each microchannel structures comprises a functional part selected from the group consisting of reaction cavity, volume defining unit, mixing cavity, and waste cavity, and wherein non-specific adsorption and hydrophilicity are optimised by a coat exposing ~~The microfluidic device of claim 6, wherein the~~a non-ionic hydrophilic polymer ~~is present~~ on the surface of at least one of the functional parts into which aqueous liquid is capable of entering ~~such functional part~~ by self-suction when the liquid has passed the entrance of the functional part.

8. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein each microchannel structure comprises a microcavity having a volume $\leq 1\ \mu l$.

9. (Currently Amended) The microfludic device of claim ~~1~~7, wherein mass transport of solutes and/or particles between different function parts of each microchannel structure uses a liquid flow caused by non-electrokinetic forces.

10. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the device is a round disc.

11. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the non-ionic hydrophilic polymer contains hydroxy groups, ethylene oxy groups, or amide groups.

12. (Previously Presented) The microfluidic device of claim 11, wherein the non-ionic hydrophilic polymer is a polyhydroxy polymer.

13. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the non-ionic hydrophilic polymer is selected from the group consisting of polysaccharides, water-soluble derivatives of polysaccharides, polyvinyl alcohols, and poly(hydroxy alkyl vinylether) polymers.

14. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the non-ionic hydrophilic polymer is a reaction product between ethylene oxide and a dihydroxy or a polyhydroxy compound.

15. (Previously Presented) The microfluidic device of claim 11, wherein the non-ionic hydrophilic polymer comprises one or more blocks of polyoxyethylene chains.

16. (Previously Presented) The microfluidic device of claim 15, wherein the non-ionic hydrophilic polymer is polyethylene glycol.

17. (Previously Presented) The microfluidic device of claim 11, wherein the non-ionic hydrophilic polymer is polyethylene glycol which has a methoxy group at the end which does not bind to the part surface.

18. (Previously Presented) The microfluidic device of claim 11, wherein the non-ionic hydrophilic polymer comprises a plurality of amide groups.

19. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the non-ionic hydrophilic polymer a polymerisate/copolymerisate with monomers selected from the group consisting of acrylamide, methacrylamide and vinylpyrrolidone.

20. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the non-ionic hydrophilic polymer is attached to a polymer skeleton that is attached to the part surface.

21. (Previously Presented) The microfluidic device of claim 20 wherein the attachment between the non-ionic hydrophilic polymer and the polymer skeleton is covalent.

22. (Previously Presented) The microfluidic device of claim 21, wherein the polymer skeleton is an organic polymer.

23. (Previously Presented) The microfluidic device of claim 20, wherein the skeleton is selected from the group consisting of cationic, anionic, and neutral polymers.

24. (Previously Presented) The microfluidic device of claim 20, wherein the skeleton is a polyamine.

25. (Previously Presented) The microfluidic device of claim 20, wherein the skeleton is a polyethylene imine.

26. (Previously Presented) The microfluidic device of claim 20, wherein the skeleton has a molecular weight 10,000-3,000,000 dalton.

27. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the surface of the planar substrate without the coat is made of plastics and the part surface without coat is hydrophilized by plasma treatment or by an oxidation agent in order to introduce functional groups that allow for a subsequent attachment of the coat onto the part surface.

28. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the surface of the planar substrate is made of plastics and that the plastics has a non-significant fluorescence for excitation wavelengths in the interval 200-800 nm and emission wavelengths in the interval 400-900 nm.

29. (Canceled)

30. (Currently Amended) A method of performing an analytical assay using the microfluidic device of claim ~~1~~7 comprising the steps of:

preparing a sample;

a. running the assay reaction within the device; and

b. detecting within the device the result of the assay reaction, wherein the result is a measure of activity of the sample.

31. (Canceled)

32. (Canceled)

33. (Currently Amended) A microfluidic device being in a dry state that is capable of being rehydrated, said device comprises a set of one or more covered microchannel structures manufactured in the surface of a planar substrate, wherein each microchannel structures comprises a functional part selected from the group consisting of reaction cavity, volume defining unit, mixing cavity, and waste cavity, and wherein a part surface of at least one of the microchannel structures comprises a coat exposing a non-ionic hydrophilic polymer and that the surface of the planar substrate is made of plastics based on a polymer of aliphatic monomers ~~The microfluidic device of claim 32, wherein the monomer is~~ selected from the group consisting of a cycloalkene, ethylene and propylene that comprises a non-significant fluorescence for excitation wavelengths in the interval 200-800 nm and emission wavelengths in the interval 400-900 nm.

34. (Previously Presented) The microfluidic device of claim 3, wherein the plastics is based on a polymer of aliphatic monomers containing polymerizable carbon-carbon double bonds.

35. (Currently Amended) The microfluidic device of claim 34, wherein the monomer is selected from the group consisting of a cycloalkene, ethylene and propylene.

36. (Currently amended) The microfluidic device of claim ~~1~~7, wherein mass transport of solutes and/or particles between different functional parts of each microchannel structure uses a liquid flow caused by electroendoosmosis.

37. (Canceled)

38. (Canceled)

39. (Canceled)

40. (Canceled)

41. (Canceled)

42. (Currently Amended) The microfluidic device of claim ~~1~~7, wherein the surface carrying the coat is made of inorganic material.

43. (Previously Presented) The microfluidic device of claim 21, wherein the polymer skeleton is an inorganic polymer.

44. (Canceled)

45. (Previously Presented) The microfluidic device of claim 35, wherein the cycloalkene is norbornene or substituted norbornene.

46. (Canceled)

47. (Currently amended) The microfluidic device of claim ~~1~~7, wherein the microchannel structures are intended for transporting solutes and/or particles by a liquid flow from one functional part to another within the same microchannel structure.

Claims 48-53 (Canceled)

54. (New) The microfluidic device of claim 1 further comprising functional parts of a detection cavity or a chamber for chromatography.